

ABSTRACT

We disclose an apparatus and process for measuring the continuous flow of drilling cuttings in real time, on surface while drilling. Using combination of methods and sensing-measurement apparatuses we obtaining the set of signals that are directed to the data acquisition system for translating the signals to digital data and then passed to computer for further processing. The mechanical motion of drilling cuttings from the well and in to the sample catcher and further along the analyzer path is disclosed in patent US 6,386,026 B1 May 14, 2002 by author of this patent application. The principal measurements along the analyzer path is disclosed in patent US 6,386,026 B1 May 14, 2002 by author of this patent application. This patent is further development of the details of measurements at the surface, while drilling. The **apparatus** consists of the set of sensors that are placed around the analytical tube and main auger (sampling screw conveyor), obtained set of signals combination is related to the same formation with defined space-time shift. Sources of specific emissions or fields are also used. The **process** consists of:

1. Measuring the sample to obtain specific properties related to physical and petrophysical parameters of this formation (i.e. radiation, resistivity, inductivity, density, elasticity, others). Obtained signals are passed to signal conditioning and digitizer.
2. Using computer data processing on data and applying the parametrical dependencies and functionalities one skilled in arts can derive the desired discrimination in target properties, as rock type, porosity, density, and oil saturation. For instance, the natural Gamma of Sandstone cuttings is in range of 30 to 60 counts, the shale will produce 90 to 220 counts per measurement interval. The absorption diffraction properties will produce higher discrimination of the same formations. The Induction properties will reflect the conductive properties of the formation where the oil saturated formation will produce higher resistivity values. Sonic signal passing through the formation in the tube will reflect the density and granularity properties of the formation. Adding to the above combination the Differential Gas detection data obtained from apparatus patented by the author in patent US 6,276,190 B1 Aug. 21, 2001 and Quantitative Fluorescence Index Patent US

6,715,347 April 06, 2004 obtained synchronously will produce powerful set of information for exploration and production operations.